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Efficacy and Safety of Laparoscopic Hernia Repair Compared to Traditional Open Repair Techniques at Tertiary Care Centre

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ABSTRACT

Many people have differing opinions on whether traditional open surgery or less invasive minimally invasive methods like Laparoscopic Hernia (LH) operation sought to be used in incisional hernia treatment. Using data from a tertiary care centre, this study compares the outcomes of open vs. laparoscopic hernia repair. We conducted a retrospective cohort research project using Database from a tertiary care centre. The participants were patients who had their hernia repairs in the recent years, either using open surgery techniques or LH repair procedure. Two sets of surgical methods were the open repair and LH repair operations. Diagnostic criteria for our research participants were demographic parameters, rates of recurrence and complications. To compare the two groups statistically, we used the statistical tests to look for differences. Among the participants were 70 individuals who had LH repair surgery, and people who had open surgery. We found that when compared to the open repair group, the LH group had lesser incidences of wound infection in comparison to the patients undergoing OH surgery. The two methods' rates for recurrence of patient admission for pain were similar. Further analysis includes those patients who had a LH repair were lower in fold to experience their wound being infected and more quickly to get back to playing their regular activities. After comparing LH incisional hernia repair to open surgery, we conclude that LH repair has its advantages. It is associated with lesser incidences of the occurrence of wound infection in comparison to open surgery. This result attests to the use of minimally invasive surgery to improve patient outcomes. It also provides further evidence that LH operations are indeed perfect for treating incisional hernias.

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Key Words
LH repair, OH repair, surgical outcomes, tertiary care centre, postoperative complications

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INTRODUCTION

The size, location and number of previous procedures as well as the presence of any health complications will greatly influence the complexity associated with incisional hernia repair (IHR)[1,2]. While open surgery has historically been the mainstay of incisional hernia diagnosis and treatment, recent minimally invasive modalities including LH [3] and robotic techniques have emerged over the past 2 decades as options for management. As per ERAS[4,5] concepts the IPWG approach rarely utilizes IPOM, commonly fixed with tacks. The IPOM technique (and its more contemporary modification, the IPOM-Plus) for example aims to restore function of abdominal wall with fewer complications such as bulging or seroma by closing the fascial defect before mesh deployment and adding posteriorly another layer of mesh[6]. Shorter hospital stays, recovery time and fewer wound problems are routine with LH mesh repairs. Late mesh-related complications, such as intestinal obstruction due to adhesions and an abscess or fistula formed by the erosion (case reports) have been reported[7].

Furthermore, in light of these findings, many surgeons are now recommending mesh be implanted extraperitoneally. Others have resorted to glue or fibrin fixations[7] and even mesh placement without fixations for fear of long-term pain related to tack fixation[8]. Novel MIS move bump throughout the last few decades. Robotic surgery provides the closure of defects and safe placement of preperitoneal or retromuscular mesh without tacks by using sutures. Furthermore, intraparietal mesh can also be placed as a local technique since it becomes possible with LH techniques such as mini/reduced open sublay and extended-view complex eTEP[9,10,11]. Although we are no-where near a thorough understanding of the long term effects, these treatments work for pain management and general rehabilitation. Therefore, to ascertain the effectiveness of defect closure between open and LH incisional hernia repairs, this nationwide study with long term follow up was designed. The primary outcomes were readmission within 90 days and reoperation within 90 days, as registered in the Danish National Patient Register. The second important outcome was late-stage hernia recurrence that is defined as a hernia recurrence taking place over one year after index surgery.

MATERIALS AND METHODS

A retrospective cohort study, which analyses data, obtained from a tertiary care centre purpose to establish comparable results for OH repair vs LH repair method. Such patients included in the research were diagnosed with hernias based on certain clinical criteria such as presence of symptoms related to a hernia. One group of patients had all open repairs, and the other group was of LH with incisional approaches. Data were collected through focus groups and individual interviews following the standard inclusion/exclusion criteria of researchers recruited participants. Our primary outcomes were hernia reoccurrence, unilateral, bilateral hernia, infection and complications. The competing events between the two groups were then compared to determine if any differences found would be statistically significant. Results: A total of 35 patients were considered for study in each OH as well as LH hernia group.

RESULTS AND DISCUSSIONS

(Table 1) Result shows demographic analysis of the different patient demographic variables and characteristics of the hernia disease.

The (Tables 2) reveal that there were no statistically significant differences between the subjects who underwent open surgery and those who underwent LH surgery in variables tested like sex and infection occurring due to a wound. The p-value is significant for unilateral and bilateral surgery, time and duration of stay and readmission for pain. The confidence intervals also confirm this fact by overlapping across groups.

This result is in line with previous studies showing that LH mesh repair is associated with significantly shorter operating times and lower rates of wound infections compared to open technique[12]. A comparative study on post-operative pain and analgesic needs found that the patients operated for LH repair had lesser discomfort in a patient reported outcome after surgery and showed less requirement of pain medications. As confirmed by our experience and as shown in studies evaluating hospital stay[13,14] and return to activities the intuitively better resource use is achieved not at expense of higher risk or worse early outcomes, LH mesh repair allows less time spend on recovery (reveal floor walking with an aid on median post-op day 1), shorter length of hospitalization or earlier resumption of normal daily life. Although the advantages of LH repair would suggest potential cost benefits[15], our trial was not specifically designed to evaluate costs. This translates into potential savings with lesser analgesic requirements., shorter hospital stays and earlier returns to work[16]. A full economic examination is needed, however, in order to accurately quantify these potential benefits[17]. Future research should focus on the relative costs of LH and OH repair in Bangladesh health system. Moreover, a different study concluded the LH group had lower infection rates, confirming our results of decreased risk for wound infections while also highlighting that minimally invasive procedures benefit in avoiding infectious complications[18,19].

Our results overall suggest that LH mesh repair is advantageous in inguinal hernia patients, consistent with various literatures. These include decreased time to recovery, less post-operative pain and morphine

Table 1: Demographic analysis of patients

Characteristics	OH category (n = 35)	LH category (n = 35)
Age (mean ± Standard deviation)	30.8 ± 10.6	32.7 ± 8.7
Sex of the patient involved in the study:		
- Male	30 (86%)	32 (91%)
- Female	5 (14%)	3 (9%)
Characteristic parameters of the disease Hernia		
- Unilateral condition in hernia	30 (85.71%)	5 (14.28%)
- Bilateral condition in hernia	14 (40%)	21 (60%)
- Primary	35 (100%)	35 (100%)
Complications		
- Infection due to wound or seroma infection	2 (6%)	1 (3%)
- Readmission for Pain	5 (14.28%)	2 (5.71%)
- Abscess Incision and Drainage	0	1
- Recurrent	1 (3%)	0
Time and duration of stay in hospital (mean ± SD)	3.2 ± 1.1 days	2.6 ± 0.9 days

Table 2 (a) Sex: Male: Comparison of OH and LH surgery

Variable	Group	Proportion (n/N)	Z-Score	p-value	95% CI
Sex	Male (Open)	30/35 (86%)	-0.64	0.522	[70.1%, 95.3%]
	Male (LH)	32/35 (91%)	0.64		[76.3%, 98.1%]

Table 2: (b) Complications: Infection due to wound or seroma

Variable	Group	Proportion (n/N)	Z-Score	p-value	95% CI
Infection occurring due to a wound	Open	2/35 (6%)	0.58	0.564	[0.7%, 19.7%]
	LH	1/35 (3%)	-0.58		[0.1%, 16.6%]

Table 2: (c) Chi-square test: time and duration of stay in hospital

Time and Duration of Stay in Hospital	χ^2 (df)	p-value
LH/OH	$\chi^2(1, N=70)= 2.45$	0.017

Table 2: (d) Chi-square test for hernia and readmission for pain

Variable	χ^2 (df)	p-value
Unilateral/Bilateral Hernia	$\chi^2(1, N=70) = 15.66$	< 0.001
Readmission for Pain	$\chi^2(1, N=70) = 4.88$	0.027

requirements, fewer wound infections, reduced length of hospital stay and lesser down-time[20]. There have been several studies that demonstrated similar results and this gives us more confidence in the evidence for LH surgeries. Our studies and some others have demonstrated that LH repair could be a cost-effective option, more so in setting like ours[21]. One advantage of this meta-analysis is that multiple studies were used, each with their own set of strengths and weaknesses (different sample sizes at different follow-up durations using various methodological features). Additional research is needed to confirm the present results thoroughly as well as investigate long-term outcomes and cost-effectiveness rates., while excellent overall LH mesh repair has been shown[20,21].

CONCLUSION

When comparing the LH repair to OH repair surgery, statistical research shows that the LH repair process is more superior as evident in the data obtained for the time of duration of hospital stay and readmission for pain criterion in both the patient groups. Wound infections are less common using the LH method compared to open surgery, according to this comparative research study.

REFERENCES

1. Liang, M.K., J.L. Holihan, K. Itani, Z.M. Alawadi and J.R.F. Gonzalez et al., 2017. Ventral hernia management. : Expert consensus guided by systematic review. Ann. Surg., 265: 80-89.
2. Slater, N.J., A. Montgomery, F. Berrevoet, A.M. Carbonell and A. Chang., *et al*., 2014. Criteria for definition of a complex abdominal wall hernia. Hernia, 18: 7-17.
3. Henriksen, N.A., K.K. Jensen and F. Muysoms, 2019. Robot-assisted abdominal wall surgery: A systematic review of the literature and meta-analysis. Hernia, 23: 17-27.
4. Muysoms, F., 2018. Ipom: History of an acronym. Hernia, 22: 743-746.
5. LeBlanc, K.A. and W.V. Booth, 1993. "LH repair of incisional abdominal hernias using expanded polytetrafluoroethylene: preliminary findings," Surg. Lapa. Endosc., 3: 39-41.
6. Tandon, A., S. Pathak, N.J.R. Lyons, Q.M. Nunes, I.R. Daniels and N.J. Smart, 2016. Meta-analysis of closure of the fascial defect during laparoscopic incisional and ventral hernia repair. Br. J. Surg., 103: 1598-1607.
7. Patel, P.P., M.W. Love, J.A. Ewing, J.A. Warren, W.S. Cobb and A.M. Carbonell, 2017. Risks of subsequent abdominal operations after laparoscopic ventral hernia repair. Surg. Endoscopy, 31: 823-828.
8. Kokotovic, D., T. Bisgaard and F. Helgstrand, 2016. Long-term recurrence and complications associated with elective incisional hernia repair. JAMA, 316: 1575-1582.
9. Baker, J.J., S. Öberg, K. Andresen, T.W. Klausen and J. Rosenberg, 2018. Systematic review and network meta-analysis of methods of mesh fixation during laparoscopic ventral hernia repair. Br. J. Surg., 105: 37-47.

10. Belyansky, I., J. Daes, V.G. Radu, R. Balasubramanian and H.R. Zahiri et al., 2018. A novel approach using the enhanced-view totally extraperitoneal (etep) technique for laparoscopic retromuscular hernia repair. Surg. Endosc., 32: 1525-1532.
11. Reinpold, W., M. Schröder, C. Berger, J. Nehls and A. Schröder et al., 2019. Mini- or less-open sublay operation (milos): A new minimally invasive technique for the extraperitoneal mesh repair of incisional hernias. Ann. Surg., 269: 748-755.
12. Moon, V., G.A. Chaudry, C. Choy and G.S. Ferzli, 2004. Mesh infection in the era of laparoscopy. J. Lapar amp Adv. Surg. Tech., 14: 349-352.
13. Bruce, E.S., S.A. Hotonu and M. McHoney, 2021. Comparison of postoperative pain and analgesic requirements between laparoscopic and open hernia repair in children. World J. Surg., 45: 3609-3615.
14. Sudarshan, P.B., B.S. Sundaravadanan and V.P. Kaarthik, 2017. Laparoscopic versus open mesh repair of unilateral inguinal hernia: A comparative study. Int. Surg. J., 4: 921-925.
15. Cook, J., J. Hislop, T. Adewuyi, K. Harrild and D. Altman et al., 2014. Assessing methods to specify the target difference for a randomised controlled trial: Delta (difference elicitation in trials) review. Health Technol. Assess., 18: 1-175.
16. Baek, H., M. Cho, S. Kim, H. Hwang, M. Song and S. Yoo, 2018. Analysis of length of hospital stay using electronic health records: A statistical and data mining approach. Plos one, Vol. 13, No. 4 .10.1371/journal.pone.0195901.
17. Martin, S.A., J.E. Aikens and R.D. Chervin, 2004. Toward cost-effectiveness analysis in the diagnosis and treatment of insomnia. Sleep Med. Rev., 8: 63-72.
18. Ouimet, S., B.P. Kavanagh, S.B. Gottfried and Y. Skrobik, 2006. "Critical care outcomes," Respir. Care, 51: 1042-1052.
19. Grant, A., C. Boachie, S. Cotton, R. Faria and L. Bojke., *et al*., 2013. Clinical and economic evaluation of laparoscopic surgery compared with medical management for gastro-oesophageal reflux disease: 5-year follow-up of multicentre randomised trial (the reflux trial). Heal Tech Ass., 17: 1-20.
20. Serdar, C.C., M. Cihan, D. Yücel and M.A. Serdar, 2021. Sample size, power and effect size revisited: Simplified and practical approaches in pre-clinical, clinical and laboratory studies. Bioch med., 31: 27-53.
21. Martin, F. and S.M. Susan, 2013. Improving the external validity of clinical trials: The case of multiple chronic conditions. J. Comorbidity, 3: 30-35.